

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C. 20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

| | |
|---|---|
| Date of mailing (day/month/year) 28 August 2000 (28.08.00) | |
| International application No. PCT/AU99/01135 | Applicant's or agent's file reference 7480/26160 |
| International filing date (day/month/year) 21 December 1999 (21.12.99) | Priority date (day/month/year) 21 December 1998 (21.12.98) |
| Applicant PAN, Jie et al | |

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
21 July 2000 (21.07.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

F. Baechler

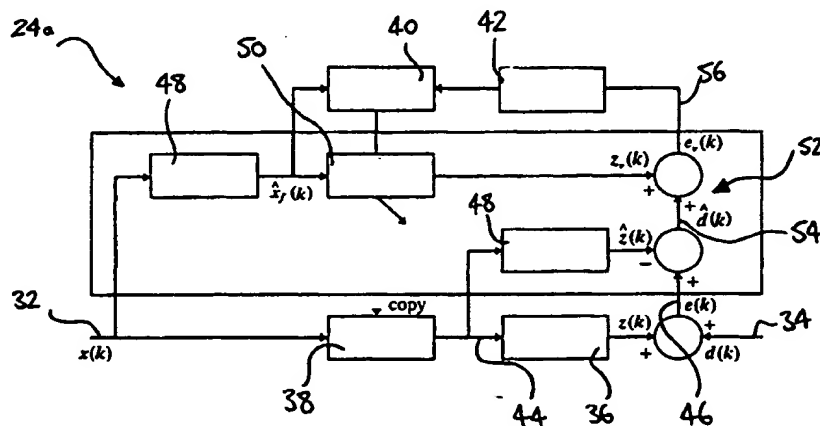
Telephone No.: (41-22) 338.83.38



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

| | | |
|---|-----------|---|
| (51) International Patent Classification ⁷ : G10K 11/178 | A1 | (11) International Publication Number: WO 00/38173 (43) International Publication Date: 29 June 2000 (29.06.00) |
| (21) International Application Number: PCT/AU99/01135 (22) International Filing Date: 21 December 1999 (21.12.99) (30) Priority Data: PP 7826 21 December 1998 (21.12.98) AU (71) Applicant (for all designated States except US): THE UNIVERSITY OF WESTERN AUSTRALIA [AU/AU]; Stirling Highway, Nedlands, Perth, Western Australia 6907 (AU). (72) Inventors; and (75) Inventors/Applicants (for US only): PAN, Jie [AU/AU]; The University of Western Australia, Dept. of Mechanical and Materials Engineering, Stirling Highway, Nedlands, Perth, Western Australia 6907 (AU). CHAOYING, Bao [AU/AU]; The University of Western Australia, Dept. of Mechanical and Materials Engineering, Stirling Highway, Nedlands, Perth, Western Australia 6907 (AU). PAUROBALLY, Mohammed, Roshun [AU/AU]; The University of Western Australia, Dept. of Mechanical and Materials Engineering, Stirling Highway, Nedlands, Perth, Western Australia 6907 (AU). GREENHALGH, Rob [AU/AU]; 38 Robin Avenue, Sorrento, Perth, Western Australia 6020 (AU). | | (74) Agent: SUDDABY, Mark; Wray & Associates, 239 Adelaide Terrace, Perth, Western Australia 6000 (AU). (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> |

(54) Title: NOISE REDUCTION APPARATUS



(57) Abstract

A noise reduction apparatus (10) for an enclosure (12) is disclosed, comprising error sensors (22a, 22b) to generate an error signal (46), reference sensors (22a, 22b, 22c), a controller (24) having a reference signal conditioning circuit (24c) to produce a reference signal (32) from the reference sensors (22a, 22b, 22c), the controller (24) being responsive to the reference signal (32) to produce a control signal (44); transducers (26a, 26b) responsive to the control signal (44) to reduce noise in the enclosure (12) near the error sensors (22a, 22b). The controller (12) comprises a first controller (38) responsive to the reference signal (32) to produce the control signal (44) for the transducers (26a, 26b), a plant model (48) responsive to the reference signal (32) to produce a signal input to a second controller (50), signal generating circuit (52) for producing a further error signal (56) from the output of the second controller (50), the output of the first controller (38) and the error signal (46), and an adaptive LMS system (40) responsive to the further error signal (56) to adjust the parameters of the first and second controllers (38, 50) simultaneously. The controller (24) allows fast convergence rates compared with filtered-X controllers. A shaping filter (42) is provided to allow a user to adjust the attenuation characteristics of the controller (42) to suit his or her preference.

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Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 99/01135

| | | |
|---|--|--|
| A. CLASSIFICATION OF SUBJECT MATTER | | |
| Int Cl ⁷ : G10K 11/178 | | |
| According to International Patent Classification (IPC) or to both national classification and IPC | | |
| B. FIELDS SEARCHED | | |
| Minimum documentation searched (classification system followed by classification symbols) G10K 11/178 | | |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC: AU AS ABOVE | | |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPAT: error, control | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | |
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X | US 5758311 A (Tsuiji et al.) 26 May 1998 | 1 - 3, 13 - 15 |
| X | GB 2282933 A (Sharp Kabushiki Kaisha) 19 April 1995 | 1 - 3, 13 - 15 |
| A | WO 97/50078 A (United Technologies Corporation) 31 December 1997 | 1 - 24 |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex | | |
| <p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p> | | |
| Date of the actual completion of the international search 21 February 2000 | | Date of mailing of the international search report 24 FEB 2000 |
| Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929 | | Authorized officer CATHERINE REES Telephone No.: (02) 6283 2555 |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 99/01135

| C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|---|--|-----------------------|
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A | WO 96/14634 A (Lord Corporation) 17 May 1996 | 1 - 24 |
| A | GB 2257327 A (Honda Giken Kogyo Kabushiki Kaisha) 6 January 1993 | 1 - 24 |

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/AU 99/01135

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

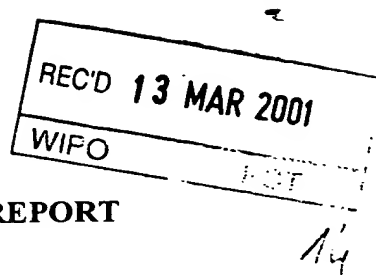
| Patent Document Cited in Search Report | | | | Patent Family Member | | | |
|--|----------|----|----------|----------------------|---------|----|---------|
| US | 5758311 | JP | 7261774 | | | | |
| GB | 2282993 | JP | 7110693 | US | 5774564 | | |
| WO | 97/50078 | AU | 30063/97 | BR | 9710041 | EP | 907948 |
| | | NO | 986058 | US | 5828760 | | |
| WO | 96/14634 | EP | 789900 | US | 5745580 | | |
| GB | 2257327 | DE | 4221292 | JP | 5011783 | US | 5410605 |
| END OF ANNEX | | | | | | | |

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)



| | | |
|---|--|--|
| Applicant's or agent's file reference SGK:MES | FOR FURTHER ACTION | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416). |
| International Application No. PCT/AU99/01135 | International Filing Date (day/month/year) 21 December 1999 | Priority Date (day/month/year) 21 December 1998 |
| International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ G10K 11/178 | | |
| Applicant THE UNIVERSITY OF WESTERN AUSTRALIA et al | | |

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|------|---|---|-------------------------------------|---------------------|----|--------------------------|----------|-----|--------------------------|--|----|--------------------------|----------------------------|---|-------------------------------------|---|----|--------------------------|-------------------------|-----|--------------------------|--|------|--------------------------|---|
| 1. | This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36. | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | This REPORT consists of a total of 3 sheets, including this cover sheet. <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of sheet(s). | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | This report contains indications relating to the following items: <table border="0"><tr><td>I</td><td><input checked="" type="checkbox"/></td><td>Basis of the report</td></tr><tr><td>II</td><td><input type="checkbox"/></td><td>Priority</td></tr><tr><td>III</td><td><input type="checkbox"/></td><td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td></tr><tr><td>IV</td><td><input type="checkbox"/></td><td>Lack of unity of invention</td></tr><tr><td>V</td><td><input checked="" type="checkbox"/></td><td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td></tr><tr><td>VI</td><td><input type="checkbox"/></td><td>Certain documents cited</td></tr><tr><td>VII</td><td><input type="checkbox"/></td><td>Certain defects in the international application</td></tr><tr><td>VIII</td><td><input type="checkbox"/></td><td>Certain observations on the international application</td></tr></table> | I | <input checked="" type="checkbox"/> | Basis of the report | II | <input type="checkbox"/> | Priority | III | <input type="checkbox"/> | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | IV | <input type="checkbox"/> | Lack of unity of invention | V | <input checked="" type="checkbox"/> | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | VI | <input type="checkbox"/> | Certain documents cited | VII | <input type="checkbox"/> | Certain defects in the international application | VIII | <input type="checkbox"/> | Certain observations on the international application |
| I | <input checked="" type="checkbox"/> | Basis of the report | | | | | | | | | | | | | | | | | | | | | | | |
| II | <input type="checkbox"/> | Priority | | | | | | | | | | | | | | | | | | | | | | | |
| III | <input type="checkbox"/> | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | | | | | | | | | | | | | | | | | | | | | | | |
| IV | <input type="checkbox"/> | Lack of unity of invention | | | | | | | | | | | | | | | | | | | | | | | |
| V | <input checked="" type="checkbox"/> | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | | | | | | | | | | | | | | | | | | | | | | | |
| VI | <input type="checkbox"/> | Certain documents cited | | | | | | | | | | | | | | | | | | | | | | | |
| VII | <input type="checkbox"/> | Certain defects in the international application | | | | | | | | | | | | | | | | | | | | | | | |
| VIII | <input type="checkbox"/> | Certain observations on the international application | | | | | | | | | | | | | | | | | | | | | | | |

| | |
|---|---|
| Date of submission of the demand 21 July 2000 | Date of completion of the report 6 March 2001 |
| Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929 | Authorized Officer CATHY REES Telephone No. (02) 6283 2214 |

I. Basis of the report

1. With regard to the elements of the international application:*
- ☒ the international application as originally filed.
- ☐ the description, pages , as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the claims, pages , as originally filed,
 pages , as amended (together with any statement) under Article 19,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the drawings, pages , as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the sequence listing part of the description:
 pages , as originally filed
 pages , filed with the demand
 pages , received on with the letter of
2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, was on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
4. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

| | | |
|-------------------------------|---------------|-----|
| Novelty (N) | Claims 1 - 24 | YES |
| | Claims | NO |
| Inventive step (IS) | Claims 1 - 24 | YES |
| | Claims | NO |
| Industrial applicability (IA) | Claims 1 - 24 | YES |
| | Claims | NO |

2. Citations and explanations (Rule 70.7)Citations:

a) US 5758311

b) GB 2282933

Novelty (N) and Inventive Step (IS):

Neither of the above citations disclose or even suggest the invention as claimed.